VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION
FORM D: MUNICIPAL EFFLUENT AND BIOSOLIDS

PART D-VI: LAND APPLICATION AGREEMENT - BIOSOLIDS AND INDUSTRIAL RESIDUALS

A. This land application agreement is made on 2/19/16 between Kenneth W. Kite, referred to here as "Landowner", and Houff's Feed & Fertilizer, referred to here as the "Permittee". This agreement remains in effect until it is terminated in writing by either party or, with respect to those parcels that are retained by the Landowner in the event of a sale of one or more parcels, until ownership of all parcels changes. If ownership of individual parcels identified in this agreement changes, those parcels for which ownership has changed will no longer be authorized to receive biosolids or industrial residuals under this agreement.

Landowner:

The Landowner is the owner of record of the real property located in Rockingham County, Virginia, which includes the agricultural, silvicultural or reclamation sites identified below in Table 1 and identified on the tax map(s) attached as Exhibit A.

Table 1.: Parcels authorized to receive biosolids, water treatment residuals or other industrial sludges

Tax Parcel ID	Tax Parcel ID	Tax Parcel ID	Tax Parcel ID
115-2-L2D			
115-2-L2E			

☐ Additional parcels containing Land Application Sites are identified on Supplement A (check if applicable)

Check one:
- ✓ The Landowner is the sole owner of the properties identified herein.
- ☐ The Landowner is one of multiple owners of the properties identified herein.

In the event that the Landowner sells or transfers all or part of the property to which biosolids have been applied within 38 months of the latest date of biosolids application, the Landowner shall:

1. Notify the purchaser or transferee of the applicable public access and crop management restrictions no later than the date of the property transfer; and
2. Notify the Permittee of the sale within two weeks following property transfer.

The Landowner has no other agreements for land application on the fields identified herein. The Landowner will notify the Permittee immediately if conditions change such that the fields are no longer available to the Permittee for application or any part of this agreement becomes invalid or the information herein contained becomes incorrect.

The Landowner hereby grants permission to the Permittee to land apply residuals as specified below, on the agricultural sites identified above and in Exhibit A. The Landowner also grants permission for DEQ staff to conduct inspections on the land identified above, before, during or after land application of permitted residuals for the purpose of determining compliance with regulatory requirements applicable to such application.

Class B biosolids	Water treatment residuals	Food processing waste	Other industrial sludges
✓ Yes ☐ No	✓ Yes ☐ No	✓ Yes ☐ No	✓ Yes ☐ No

Kenneth W. Kite — Kenneth W. Kite — 887 Shenandoah Avenue, Elkton, VA 22827
Landowner – Printed Name, Title — Signature — Mailing Address

Permittee:

Houff's Feed & Fertilizer, the Permittee, agrees to apply biosolids and/or industrial residuals on the Landowner's land in the manner authorized by the VPA Permit Regulation and in amounts not to exceed the rates identified in the nutrient management plan prepared for each land application field by a person certified in accordance with §10.1-104.2 of the Code of Virginia.

The Permittee agrees to notify the Landowner or the Landowner's designee of the proposed schedule for land application and specifically prior to any particular application to the Landowner's land. Notice shall include the source of residuals to be applied.

☐ I reviewed the document(s) assigning signatory authority to the person signing for landowner above. I will make a copy of this document(s) available to DEQ for review upon request. (Do not check this box if the landowner signs this agreement)

Timothy J. Grove — Timothy J. Grove — 97 Railside Drive, Weyers Cave, VA 24486
Permittee – Authorized Representative Printed Name — Signature — Mailing Address

VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION: PART D-VI LAND APPLICATION AGREEMENT

Permittee: Houff's Feed & Fertilizer **County or City: Rockingham**

Landowner: Kenneth W. Kite

Landowner Site Management Requirements:

I, the Landowner, I have received a DEQ Biosolids Fact Sheet that includes information regarding regulations governing the land application of biosolids, the components of biosolids and proper handling and land application of biosolids.

I have also been expressly advised by the Permittee that the site management requirements and site access restrictions identified below must be complied with after biosolids have been applied on my property in order to protect public health, and that I am responsible for the implementation of these practices.

I agree to implement the following site management practices at each site under my ownership following the land application of biosolids at the site:

1. Notification Signs: I will not remove any signs posted by the Permittee for the purpose of identifying my field as a biosolids land application site, unless requested by the Permittee, until at least 30 days after land application at that site is completed.

2. Public Access
    a. Public access to land with a high potential for public exposure shall be restricted for at least one year following any application of biosolids.
    b. Public access to land with a low potential for public exposure shall be restricted for at least 30 days following any application of biosolids. No biosolids amended soil shall be excavated or removed from the site during this same period of time unless adequate provisions are made to prevent public exposure to soil, dusts or aerosols;
    c. Turf grown on land where biosolids are applied shall not be harvested for one year after application of biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by DEQ.

3. Crop Restrictions:
    a. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after the application of biosolids.
    b. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after the application of biosolids when the biosolids remain on the land surface for a time period of four (4) or more months prior to incorporation into the soil,
    c. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months when the biosolids remain on the land surface for a time period of less than four (4) months prior to incorporation.
    d. Other food crops and fiber crops shall not be harvested for 30 days after the application of biosolids;
    e. Feed crops shall not be harvested for 30 days after the application of biosolids (60 days if fed to lactating dairy animals).

4. Livestock Access Restrictions:
    Following biosolids application to pasture or hayland sites:
    a. Meat producing livestock shall not be grazed for 30 days,
    b. Lactating dairy animals shall not be grazed for a minimum of 60 days.
    c. Other animals shall be restricted from grazing for 30 days;

5. Supplemental commercial fertilizer or manure applications will be coordinated with the biosolids and industrial residuals applications such that the total crop needs for nutrients are not exceeded as identified in the nutrient management plan developed by a person certified in accordance with §10.1-104.2 of the Code of Virginia;

6. Tobacco, because it has been shown to accumulate cadmium, should not be grown on the Landowner's land for three years following the application of biosolids or industrial residuals which bear cadmium equal to or exceeding 0.45 pounds/acre (0.5 kilograms/hectare).

Kenneth W Kite 2/19/16

Landowner's Signature Date

Site: KITE
Owner: Kenny Kite
Operator: Kenny Kite

Tax Map

N
W E
S

0 950 1,900 3,800 Feet

TaxParcels042008
KITE Fields

Houff's FEED & FERTILIZER


LAYER: Parcels
Property Card:
NOTE: Property cards are updated
Tax Map #:
115-(2)- L2D
KITE KENNETH W
Owner Address:
887 SHENANDOAH AVEELKTON, VA
911 Address:
Primary Zone:
A1
Secondary Zone:
Land Code:
Proffer:
Acres:
Deed Book:
1085
Deed Page:
278
Land Value:
Improvements:
Total Value:
Sale Date:
Sale Price:
Shenandoah Ave
Shen Elk Plz


LAYER: Parcels
Property Card:
NOTE: Property cards are updated
Tax Map #:
115-(2)- L2E
KITE KENNETH W
Owner Address:
887 SHENANDOAH AVEELKTON, VA
911 Address:
Primary Zone:
A1
Secondary Zone:
Land Code:
Proffer:
Acres:
Deed Book:
4123
Deed Page:
158
Land Value:
Improvements:
Total Value:
Sale Date:
Sale Price:
Elk Pl

GENERAL LOCATION MAP
North River Farm

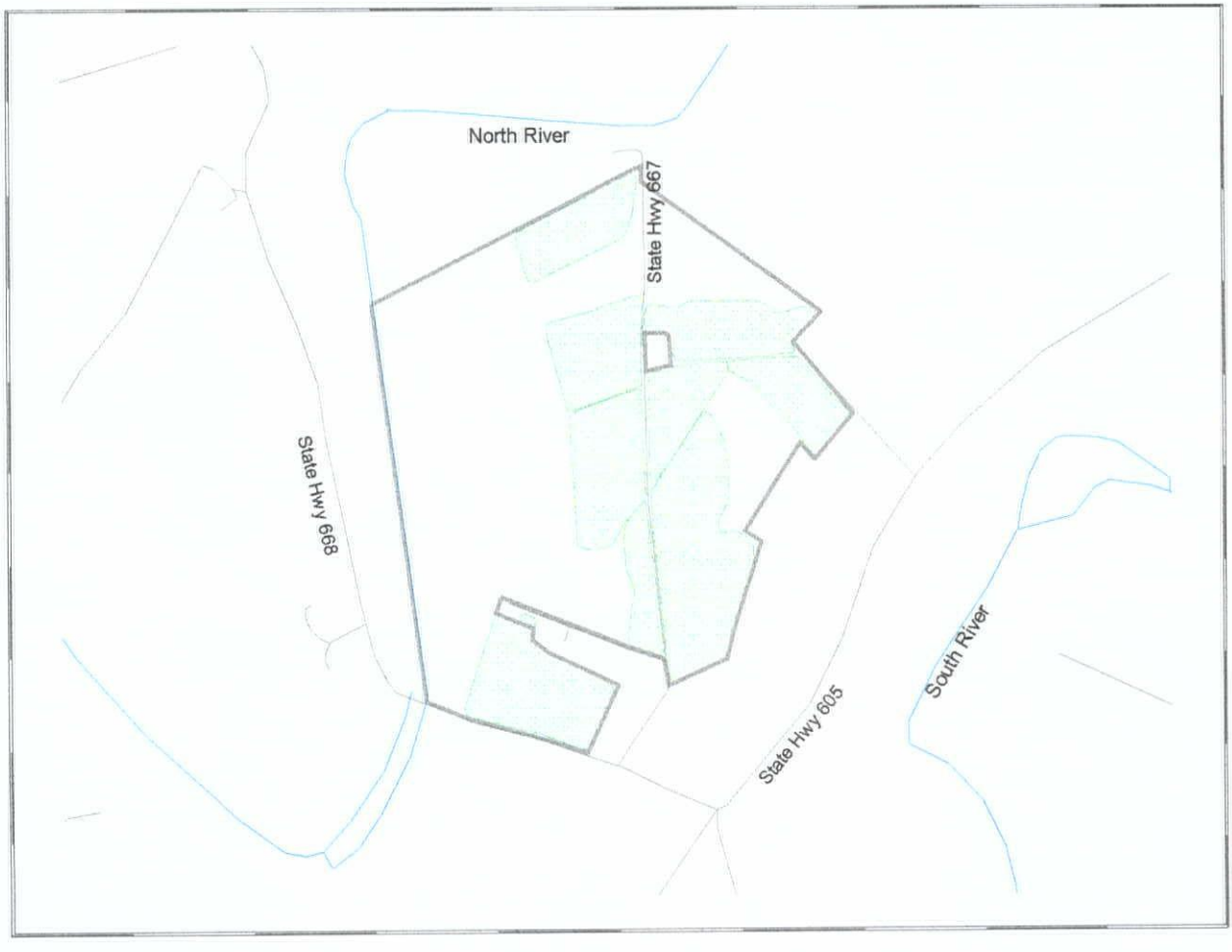
Projection : Universal Transverse Mercator
Datum : WGS Datum (1984)
Zone Number : 17
Hemisphere : North

Scale 1 : 66639
10000 ft

THE VISION SYSTEM

EXHIBIT A - LOCATION MAP
Site WALK

North River Farm
North River Associates, Landowner
Jack Walker, Operator



LEGEND

- Property line
- Road
- River/watercourse
- Railroad
- Field

Houff's FEED & FERTILIZER

Projection : Universal Transverse Mercator
Datum : WGS Datum (1984)
Zone Number : 17
Hemisphere : North

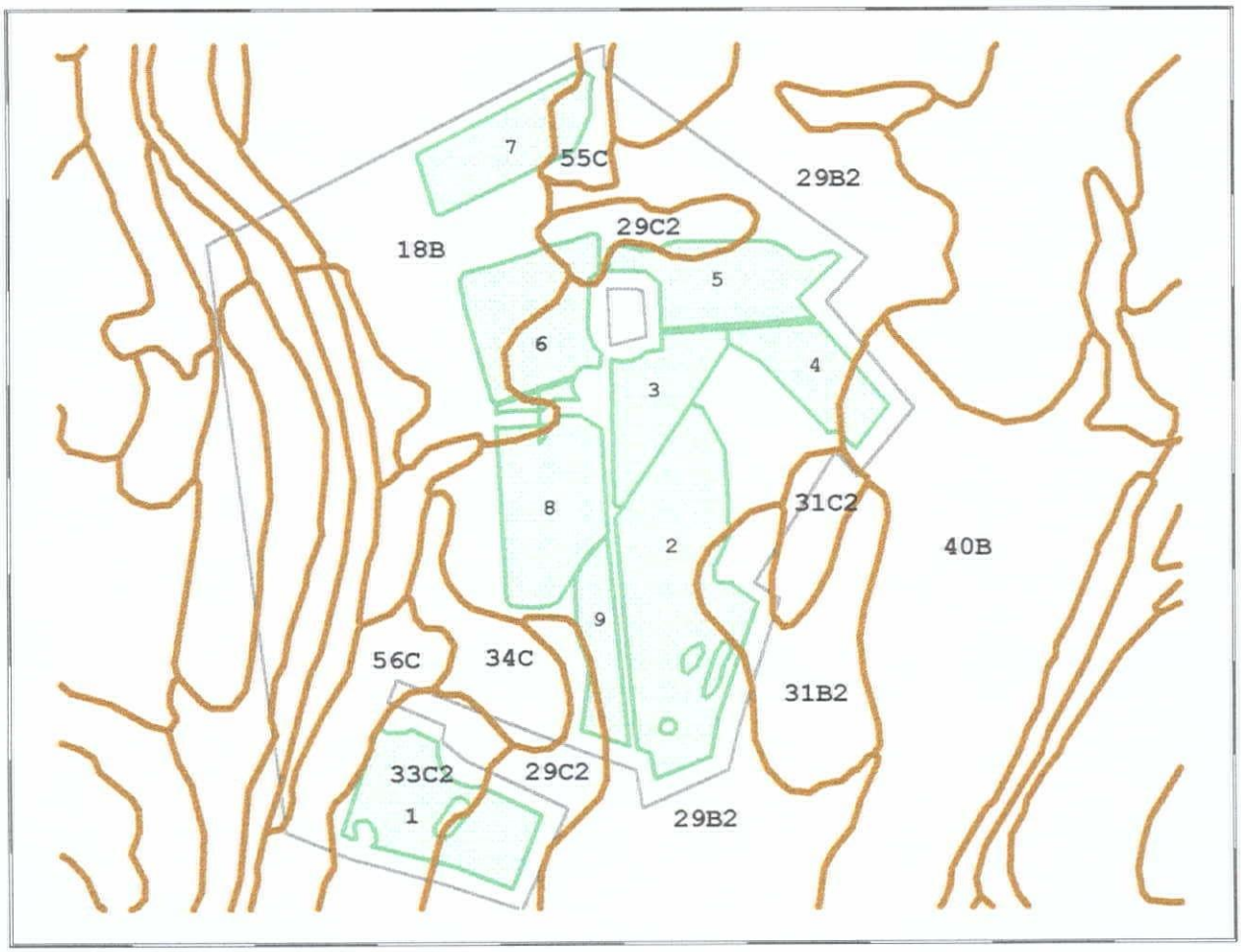
Scale 1 : 18962
1000 ft

N W E S

THE VISION SYSTEM

EXHIBIT B - SOILS MAP
Site WALK

North River Farm
North River Associates, Landowner
Jack Walker, Operator



LEGEND

Property line
Field
Soils boundary

Large numbers designate soil series.
small numbers designate field.

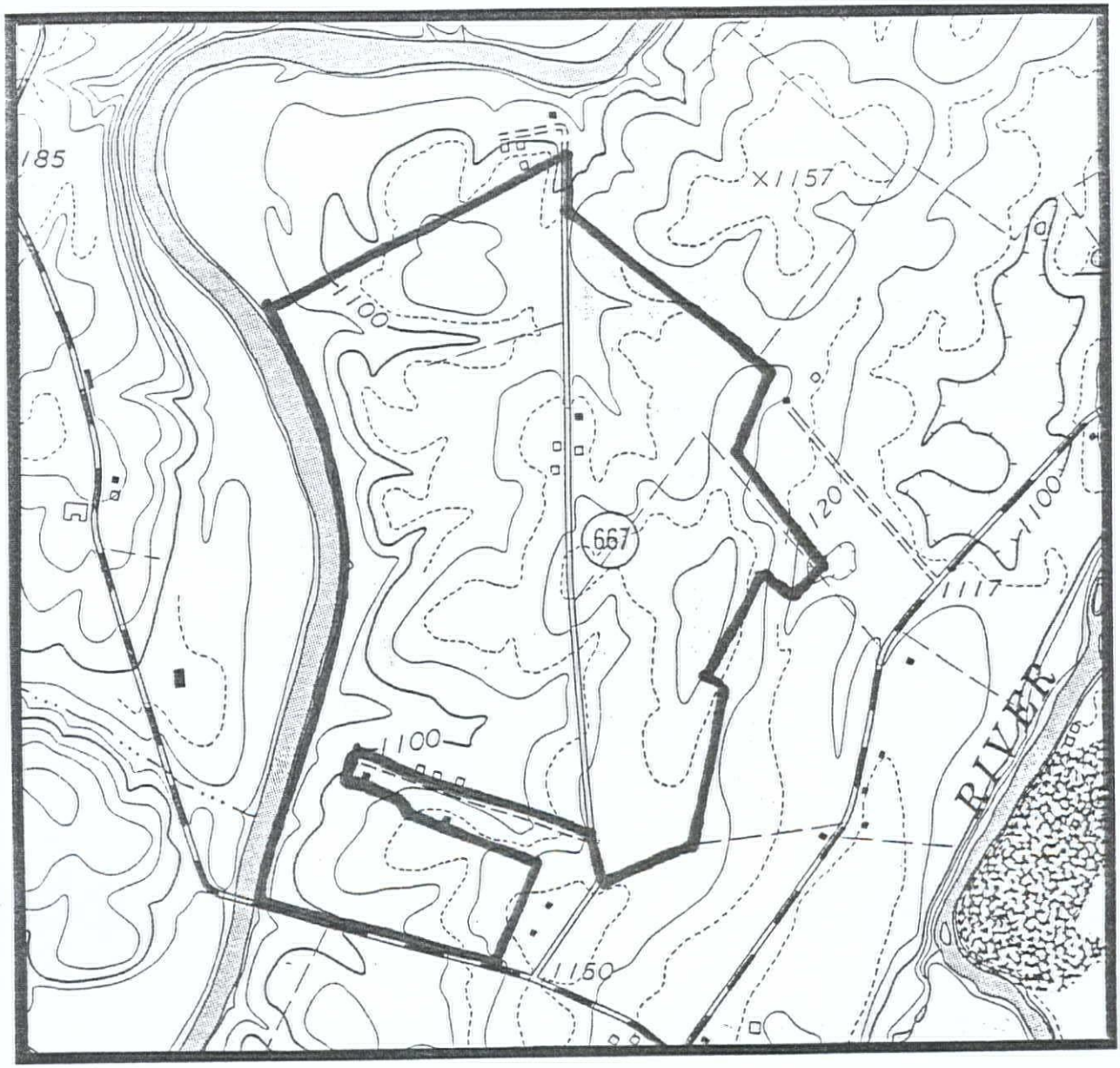
Projection : Universal Transverse Mercator
Datum : WGS Datum (1984)
Zone Number : 17
Hemisphere : North

Scale 1 : 12995
1000 ft

THE VISION SYSTEM

EXHIBIT C - TOPOGRAPHIC MAP
Site WALK

North River Farm
North River Associates, Landowner
Jack Walker, Operator



Houff's
FEED & FERTILIZER

N

Site: WALK
Owner: North River Associates
Operator: Jack Walker

Site Map

N
W E
S

0 1,100 2,200 4,400 Feet

- WALK Roads (25 ft buffer)
- WALK Rocks (50 ft buffer)
- WALK Wells (100 ft buffer)
- WALK Property Lines (100 ft buffer)
- WALK Houses (200 ft buffer)
- WALK Fields

Houff's FEED & FERTILIZER

NUTRIENT MANAGEMENT PLAN IDENTIFICATION

Operator
Jack Walker
173 Leroy Road
Grottoes, VA 24441
540-249-5073

Integrator:*None*

Farm Coordinates
Easting: 0, Northing: 0, zone: 17

Watershed Summary
watershed: PS11
county: Rockingham

Nutrient Management Planner
Tim Grove
Houff's Feed & Fertilizer
97 Railside Drive
Weyers Cave, VA 24486
Certification Code: 273

Acreage Use Summary
Total Acreage in this plan: 121.8

Cropland:	115.	115.6
Hayland:	6.	6.2
Pasture:	0	0.
Specialty:	0	0.

Livestock Summary

Beef Cattle	0	0
Dairy Cattle	8	80
Poultry	0	0
Swine	0	0
Other	0	0

Manure Production Balance

	Imported	Produced	Exported	Used	Net
kgals	0.	584.	0.	30.7	553.3
tons	0.	0.	0.	0.	0.

Plan written 04/22/2008
Valid until 04/22/2011

Signature: _____ 5/4/10
Planner **date**

WALK Narrative

Jack Walker operates a farm located on Leroy Road off of Rt. 256 near Grottoes, Virginia in Rockingham County. Crop nutrient needs are met with biosolids and supplemental commercial fertilizer.

Nitrogen needs for hay fields receiving biosolids are adjusted to reflect total allowable PAN for all cuttings in a single year. In order to remain eligible for annual applications of biosolids, do not exceed 50% of nitrogen needs with combination of all sources of PAN, excluding residual nitrogen from previous years' applications. Splitting desired annual rate (50% of allowed) into two applications – one per cutting – is suggested for optimum nitrogen use efficiency. Consult your nutrient management planner before exceeding these rates.

Split potash recommendations greater than 100 lbs into multiple applications of 100 lbs or less.

Nutrient Management Plan Special Conditions for Nutrient Management Plans Developed for Biosolids Applications

July 2008

The following management practices will be utilized for operations using biosolids:

1. Soil samples for biosolid application fields will be analyzed at least once every three (3) years for pH, phosphorus, potassium, calcium, and magnesium in order to maximize the efficient utilization of nutrients. A representative soil sample of each field representing an area up to approximately twenty acres will be comprised of cores randomly sampled throughout the field. Soil sampling core depth will be from 0-4 inches for land that has not been tilled within the past three years, or 0-6 inches for land that has been tilled within the past three years. Soil pH will be maintained at approximate agronomic levels to promote optimum crop growth and nutrient utilization.

2. Application rates for alkaline stabilized biosolids shall be restricted in accordance with a lime requirements test determined by commercial or state soil testing laboratories listed in #3 below. Calcium carbonate equivalent loadings shall not exceed rates exected to attain soil pH values in the plow layer above 6.5 for soils located in the coastal plain and above 6.8 for soils located in other areas of the state.

3. Soil test analysis will be performed by one of the laboratories listed below. Soil phosphorus levels must be determined using the Mehlich I or Mehlich III procedure:
   - A&L Agricultural Laboratories
   - Brookside Laboratories
   - Waters Agricultural Laboratories
   - Spectrum Analytical Laboratories
   - Virginia Tech Soil Testing Lab

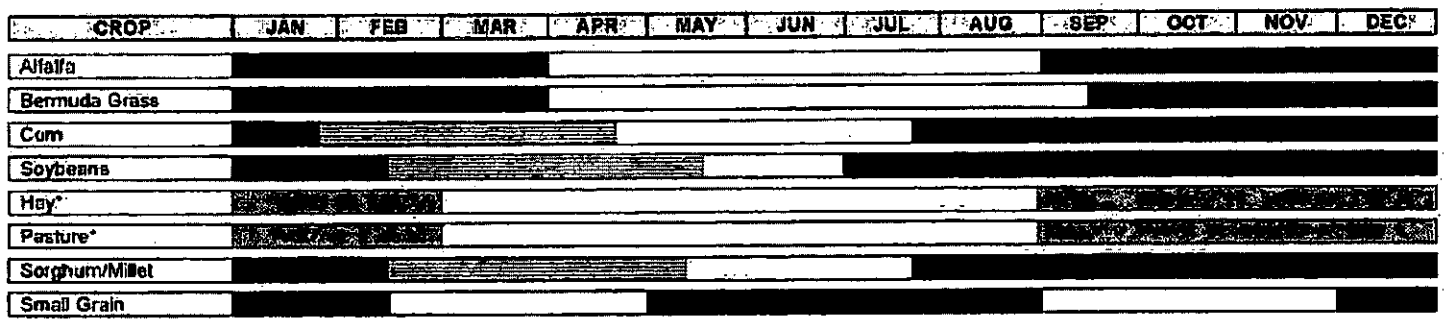
4. The actual biosolids application rates shall be based on he annual average sludge quality. Theaverage sludge quality shall established from the results of approved analytical testing of composite samples obtained during the most recent 12 months of monitoring. For proposed treatment works rates may be initially based on the biosolids characteristic produced by similar generating facilities. At a minimum, representative biosolids samples will be analyzed at the frequency and for the parameters specified in the VPA or VPDES Permit. These include but are not limited to: total nitrogen or total Kjeldahl nitrogen, ammonia-nitrogen, total phosphorus, total potassium, calcium carbonate equivalency, and and percent solids. Biosolids analysis results will be used to determine actual application rates that do not exceed the nitrogen, phosphorus, and lime application rates specified in the nutrient management plan.

5. All crops will be planted and harvested in a timely manner using commercially acceptable management practices.

6. Make biosolids applications at or near planting or to existing actively growing crops to assure that nutrients are properly utilized. Utilize the spreading schedule contained in the nutrient management plan to determine appropriate biosolids application times and rates. Additional commercial fertilizer applications (especially nitrogen) should be made as a split application separate from the biosolids application, either as a sidedress or topdress application.

7. Biosolids Spreading Schedule.

BIOSOLIDS SPREADING SCHEDULE



Note * Late fall and winter biosolids applications may be made to a trap crop only if applications are in accordance with 4VAC5-15.
Cool season grasses only, Fescue and or Orchardgrass

Spread liquid or dewatered biosolids at the rates and times specified in the nutrient management plan.

Do not spread liquid or dewatered biosolids during these shaded time periods.

Applications during these time periods shall comply with the following:

- Biosolids applications will not be made earlier than 30 days prior to planting on environmentally sensitive sites.
- On fields <u>not listed as environmentally sensitive</u>:
  - Applications of dewatered anaerobically digested or dewatered lime stabilized biosolids will not occur more than 90 days prior to spring planting on fields having (i) slopes less than 7% throughout the application area or (ii) having at least 60% uniform ground cover from crop residue.
  - Liquid biosolids applications will not occur more than 60 days prior to spring planting.

Biosolids applications should be avoided whenever possible during this period (late fall-winter). Fields must have greater than 60% uniform live cover with plant height greater than three (3) inches. Applications made to cool season grass hay and pasture, if applied after 9/1 of any year until 3/1 of the following year, shall not exceed ½ of the total nitrogen rate

As stipulated in 4VAC5-15, applications of sewage sludge to environmentally sensitive sites shall fully comply with these timing requirements immediately. Implementation of these timing requirements on nonenvironmentally sensitive sites shall be required for swage sludge applications on January 1, 2009, and thereafter.

8. For permanent hay or pasture, an adequate stand of hay and/or pasture crop species will be established prior to land application of biosolids. Commercially acceptable stands of the listed species will be maintained and other weeds and grasses controlled. All hay crops will be harvested in a timely and regular manner, removed from fields, and utilized for a suitable purpose.

9. Biosolids will be applied to application sites in a uniform manner.

10. **Do not spread biosolids within the following setback areas or as specified in the permit:**

Minimum distances to Land Application Area			
Adjacent Features	Surface Application (ft)[1]	Incorporation (ft)	Winter (ft)[2]
Occupied Dwellings	200	200	200
Water Supply wells and springs	100	100	100
Property Lines	100	50	100
Perennial streams and other surface waters except intermittent streams	50	35	100
Intermittent streams/drainage ditches	25	25	50
All improved roadways	10	5	10
Rock outcrops	25	25	25
Limestone rock outcrops and sinkholes	25	25	25
Agricultural drainage ditches with slopes equal to or less than 20%	10	5	10

Notes:
(1) Not plowed or disked to incorporate within 48 hours
(2) Application occurs on average site slope greater than 7.0% during the time between November 16 of one year and March 15 of the following year
In cases where more than one buffer distance is involved, only the single most restrictive distance shall be used.

11. Field Management Practices and Restrictions:

- Biosolids application shall not be made during times when the seasonal high water table of the soil is within 18 inches of the ground surface.

- Biosolids may only be appliced to snow-covered ground if the snow cover does not exceed one inch and the snow and biosolids are immediately incorporated within 24 hours of application.

- Liquid sludges (above 85.5% moisture content) shall not be applied to frozen ground. Dry or dewatered sludges may be applied to frozen ground only if the field has: slopes not greater than 5.0%, 60% uniform ground cover from crop residue or an existing actively growing crop such as a small grain or fescue with exposed plant height of three inches or more, a minimum of a 200-foot vegetated or adequate crop residue buffer between the application area and all surface water courses, and soils characterized by USDA as "well drained".

- Waste shall not be applied in areas subject to concentrated flow generated by runoff

from storm events such that it would discharge into sinkholes in the area.

- To avoid runoff from application fields, do not spread biosolids on soils that are saturated. If overland flow of liquid biosolids which could reach buffer areas is observed, reduce the application rate immediately to prevent runoff.

- The application rate of all application equipment shall be routinely measured as described in an approved sludge management plan and every effort shall be made to ensure uniform application of biosolids within sites in accordance with approved maximum design loading rates.

- Liquid sludges shall not be applied at rates exceeding 14,000 gallons per acre, per application. Sufficient drying times shall be allowed between subsequent applications.

- Application vehicles should be suitable for use on agricultural land. Pasture and hay fields should be grazed or clipped to a height of approximately four and siz inches, respectively, prior to biosolids application unless the biosolids can be uniformly applied so as not to mat down the vegetative cover so that the site vegetation can be clipped to a height of aproximately four inches within one week of the biosolids application. If application methods do not result in a uniform distribution of biosolids, additional operational methods shall be employed following application such as dragging with a pasture harrow, followed by clipping if required, to achieve a uniform distribution of the applied biosolids.

12. Nutrient management plans that contain fields in which row crops will be grown will be revised at least once every three (3) years. Nutrient management plans that contain only hay or pasture fields will be revised at least once every five (5) years. Any such plan revisions will be submitted to DCR and the farm operator within two weeks of the revision per 4VACS-15-100 C.

13. Biosolids applications on CRP or CREP lands must be pre-approved by NRCS and an appropriate conservation plan and NMP must be in place prior to application.

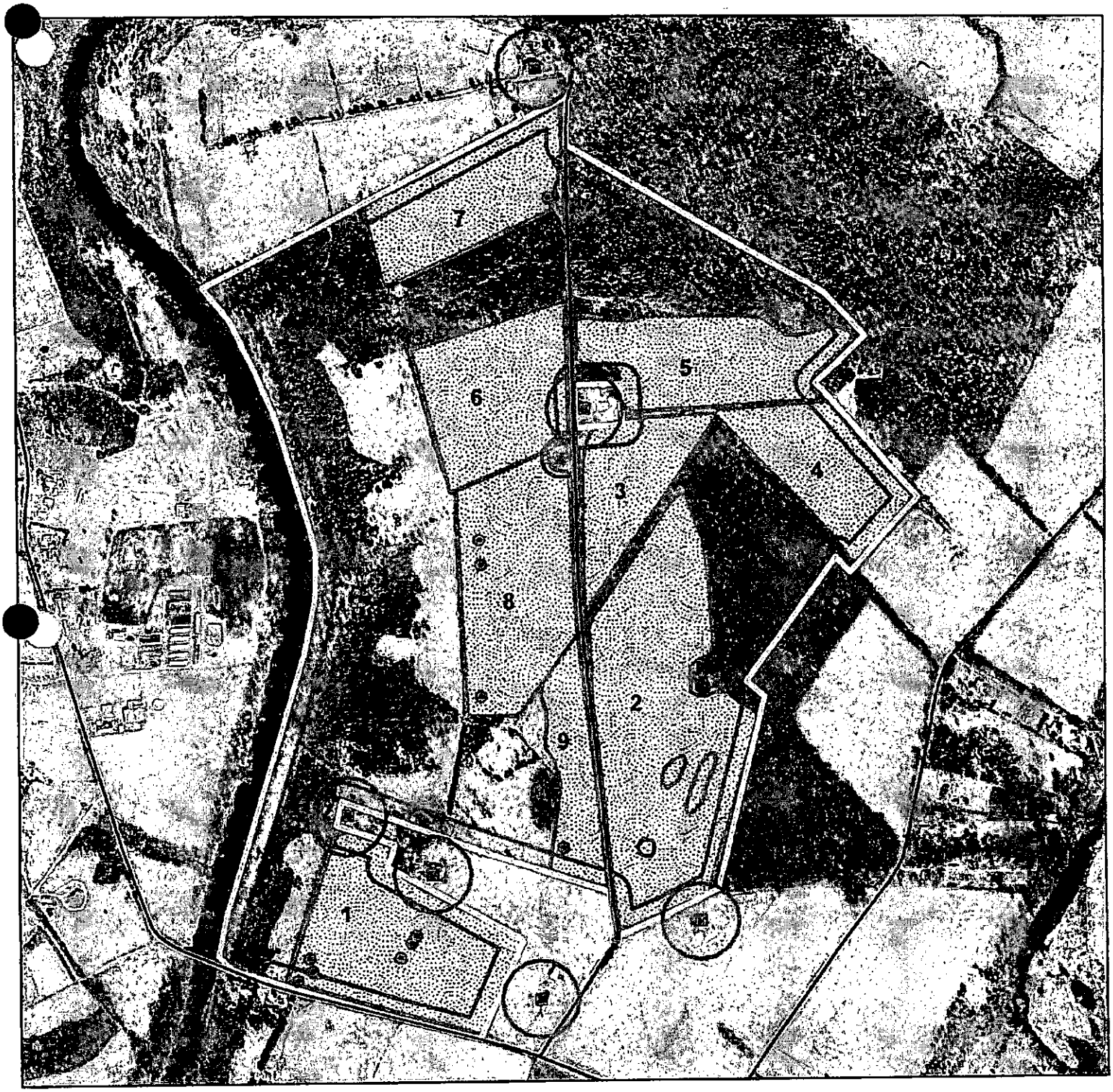
14. This nutrient management plan should be amended or modified by the certified planner who developed the initial plan if:

    - additional imported manure, biosolids, or industrial waste that was not identified in the existing plan is applied to fields under the control of the operator;
    - available land area for the utilization of biosolids decreases below the level necessary to utilize biosolids in the plan;
    - cropping systems, rotations, tillage, or fields are changed where phosphorus will be applied at levels greater than crop nutrient needs based on soil analysis; or
    - actual biosolids nutrient applications are significantly more or less than the original planned applications, such that any needed supplemental nutrient applications (from any source) would need to be amended to achieve the appropriate loading rate and yield goals.

15. Any requirements of a permit issued by DEQ, which are more restrictive, supercede these Special Conditions.

Site: WALK
Owner: North River Associates
Operator: Jack Walker

Site Map



N W E S

0 1,200 2,400 4,800 Feet

▲ WALK Wells (100 ft buffer)
● WALK Rocks (25 ft buffer)
■ WALK Houses (200 ft buffer)
WALK Property Lines (100 ft buffer)
WALK Roads (10 ft buffer)
WALK Fields

Houff's FEED & FERTILIZER

Site: WALK
Owner: North River Associates
Operator: Jack Walker

Soils Map

Houff's
FEED & FERTILIZER

Nutrient Management Plan Balance Sheet
(Fall, 2007-Summer, 2011)
WALK
Planner: Tim Grove (cert. No. 273)

Tract: North River Farm Tract **Location: Rockingham**
(N = N based, 1P = P based, 1.5P = P based at 1.5 removal, 0P = No P allowed)

Field CFSA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes	
0/N 1(N)	19/19	2007	Rye (silage)	100-30-30	0/0				100-30-30	N/A	30-0-0(br) 65-0-0(td)		
		2008	Corn (silage)	165-40-180	0/0				165-70-210	N/A	30-0-0(ba) 135-0-0(br)		
			Rye (silage)	100-20-40	0/0				100-90-250	N/A	30-0-0(br) 65-0-0(td)		
		2009	Corn (silage)	165-40-180	0/0				165-130-430	N/A	30-0-0(ba) 135-0-0(br)		
			Rye (silage)	100-20-40	0/0				100-150-470	N/A	30-0-0(br) 65-0-0(td)		
		2010	Corn (grain)	150-20-60	0/0				150-170-530	N/A	30-0-180(br) 120-0-0(br)		
			Rye (silage)	100-20-40	0/0				100-190-390	N/A	30-0-0(br) 50-0-0(td)		
0/N 2(N)	27/27	2007	Fallow	0-0-0	0/0				0-0-0	N/A			
		2008	Corn (grain)	150-0-40	0/0				150-0-40	N/A	30-0-0(ba) 120-0-0(br)		
			Fallow	0-0-0	0/0				0-0-40	N/A			
		2009	Corn (grain)	150-0-40	0/0				150-0-80	N/A	30-0-0(ba) 120-0-0(br)		
			Fallow	0-0-0	0/0				0-0-80	N/A			
		2010	Corn (grain)	150-0-40	0/0				150-0-120	N/A	30-0-0(ba) 120-0-0(br)		
			Fallow	0-0-0	0/0				0-0-120	N/A			

Tract: North River Farm Tract Location: Rockingham

Field CFSA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes	
0/N 3(N)	9/9	2007	Fallow	0-0-0	0/0				0-0-0	N/A			
		2008	Corn (grain)	150-0-80	0/0				150-0-80	N/A	30-0-0(ba) 120-0-0(br)		
			Fallow	0-0-0	0/0				0-0-80	N/A			
		2009	Corn (grain)	150-0-80	0/0				150-0-160	N/A	30-0-0(ba) 120-0-0(br)		
			Fallow	0-0-0	0/0				0-0-160	N/A			
		2010	Soybeans (FS)	0-0-60	0/0				0-0-220	N/A	0-0-60(br)		
			Fallow	0-0-0	0/0				0-0-160	N/A			
0/N 4(N)	9/9	2007	Fallow	0-0-0	0/0				0-0-0	N/A			
		2008	Corn (silage)	165-40-210	20/0				145-40-210	N/A	30-0-0(ba) 120-0-0(br)		
			Rye (silage)	100-20-60	0/0				100-60-270	N/A	30-0-0(br) 65-0-0(td)		
		2009	Corn (silage)	165-40-210	0/0				165-100-480	N/A	30-0-0(ba) 135-0-0(br)		
			Rye (silage)	100-20-60	0/0				100-120-540	N/A	30-0-0(br) 65-0-0(td)		
		2010	Soybeans (FS)	0-20-60	0/0				0-140-600	N/A	0-0-60(br)		
			Rye (silage)	100-20-60	20/0				80-160-600	N/A	30-0-0(br) 65-0-0(td)		

Tract: North River Farm Tract Location: Rockingham

Field CFSA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes
0/N 5(N)	13/13	2007	Fallow	0-0-0	0/0				0-0-0	N/A		
		2008	Soybeans (FS)	0-20-80	0/0				0-20-80	N/A	0-0-80(br)	1
			Rye (silage)	100-20-80	15/0				85-40-80	N/A	30-0-0(br) 50-0-0(td)	
		2009	Corn (silage)	165-40-240	0/0				165-80-320	N/A	30-0-0(ba) 135-0-0(br)	
			Rye (silage)	100-20-80	0/0				100-100-400	N/A	30-0-0(br) 65-0-0(td)	
		2010	Corn (silage)	165-40-240	0/0				165-140-640	N/A	30-0-0(ba) 135-0-0(br)	
			Rye (silage)	100-20-80	0/0				100-160-720	N/A	30-0-0(br) 65-0-0(td)	
0/N 6(N)	13/13	2007	Rye (silage)	100-30-30	0/0				100-30-30	N/A	30-0-0(br) 65-0-0(td)	
		2008	Corn (silage)	175-0-210	0/0				175-30-240	N/A	30-0-0(ba) 140-0-0(br)	
			Rye (silage)	100-0-60	0/0				100-30-300	N/A	30-0-0(br) 65-0-0(td)	
		2009	Corn (silage)	175-0-210	0/0				175-30-510	N/A	30-0-0(ba) 140-0-0(br)	
			Rye (silage)	100-0-60	0/0				100-30-570	N/A	30-0-0(br) 65-0-0(td)	
		2010	Soybeans (FS)	0-0-60	0/0				0-30-630	N/A	0-0-60(br)	
			Rye (silage)	100-0-60	20/0				80-30-630	N/A	30-0-0(br) 50-0-0(td)	

Tract: North River Farm Tract Location Location: Rockingham

Field CFSA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes
0/N 7(1.5P)	11/8	2007	Fallow	0-0-0	0/0				0-0-0	0		
		2008	Soybeans (FS)	0-0-80	0/0				0-0-80	36	0-0-80(br)	1
			Rye (silage)	85-0-80	15/0				70-0-80	103	30-0-0(br)	
											50-0-0(td)	
		2009	Corn (silage)	175-0-240	0/0				175-0-320	201	30-0-0(ba)	
											145-0-0(br)	
			Rye (silage)	85-0-80	0/0	2.9k ACSA-M(Fa)	>7	16-57-4	55-(70)-395	268		
						3.6k ACSA-W(Fa)	>7	14-12-2				
		2010	Corn (silage)	175-0-240	0/5	10.1k HRRSA (Sp)	>7	103-223-34	65-(295)-600	367	65-0-200(br)	
			Rye (silage)	85-0-80	0/0				85-(295)-480	434	30-0-0(br)	
											55-0-0(td)	
0/N 8(N)	16/16	2007	Rye (silage)	85-0-60	0/0				85-0-60	N/A	30-0-0(br)	
											65-0-0(td)	
		2008	Soybeans (FS)	0-0-60	0/0				0-0-120	N/A	0-0-90(br)	1
			Rye (silage)	85-0-60	15/0				70-0-90	N/A	30-0-0(br)	
											50-0-0(td)	
		2009	Corn (silage)	165-40-210	0/0				165-40-300	N/A	30-0-0(ba)	
											135-0-0(br)	
			Rye (silage)	85-20-60	0/0	1.7k ACSA-W(Fa)	>7	7-6-1	40-20-350	N/A		
						3.9k MCKEE (Fa)	>7	12-13-5				
						2.7k WHITEW(Fa)	>7	27-23-6				
		2010	Corn (silage)	165-40-210	0/12	3.9k HRRSA (Sp)	>7	39-85-13	60-(70)-540	N/A	60-0-200(br)	
						5.k WHITEW(Sp)	>7	54-47-10				
			Rye (silage)	85-20-60	0/0				85-(50)-400	N/A	30-0-0(br)	
											65-0-0(td)	
0/N 9(N)	6/6	2007	Orchardgrass hay mt.	160-50-90	0/0				160-50-90	N/A		
		2008	... ...	160-50-145	0/0	6.6k Lq Dai(Fa)	>7	35-42-102	125-60-135	N/A	80-0-0(td)	
		2009	... ...	160-50-145	0/5	6.6k Lq Dai(Fa)	>7	35-42-102	120-70-180	N/A	80-0-0(td)	
		2010	... ...	160-50-145	0/8	6.6k Lq Dai(Fa)	>7	35-42-102	115-80-225	N/A	80-0-0(td)	

Commercial Application Methods:
br - Broadcast ba - Banded sd - Sidedress

Notes:
1 broadcast at planting

Soil Test Summary

Tract	Field	Acre	Date	P2O5	K2O	Lab	Soil pH	Lime Date	rec. lime tons/Ac
North River Farm Tract	N 1	19	2008-Sp	H+ (114 P ppm)	M+ (107 K ppm)	A&L Mill	5.5		
North River Farm Tract	N 2	27	2007-Sp	VH (243 P ppm)	H (172 K ppm)	A&L Mill	6.5		
North River Farm Tract	N 3	9	2007-Sp	VH (209 P ppm)	M (104 K ppm)	A&L Mill	6.4		
North River Farm Tract	N 4	9	2008-Sp	H+ (117 P ppm)	M (88 K ppm)	A&L Mill	6.3		
North River Farm Tract	N 5	13	2008-Sp	H+ (127 P ppm)	M- (59 K ppm)	A&L Mill	5.7		
North River Farm Tract	N 6	13	2007-Sp	VH (145 P ppm)	M (89 K ppm)	A&L Mill	5.9		
North River Farm Tract	N 7	8	2008-Sp	VH (128 P ppm)	L+ (44 K ppm)	A&L Mill	6.3		
North River Farm Tract	N 8	16	2009-Sp	H+ (109 P ppm)	M (94 K ppm)	A&L Mill	6.7		
North River Farm Tract	N 9	6	2008-Sp	H (80 P ppm)	H- (143 K ppm)	A&L Mill	6.3		

Field Productivities for Major Crops

Tract Name	Tract/ Field	Field Name	Acres	Predominant Soil Series	Corn	Small Grain	Alfalfa	Grass Hay	Environmental Warnings
North River	0/0	N 1	19	Frederick	IIb	I	I	II	
	0/0	N 2	27	Frederick	IIb	I	I	II	
	0/0	N 3	9	Frederick	IIb	I	I	II	
	0/0	N 4	9	Frederick	IIb	I	I	II	
	0/0	N 5	13	Frederick	IIb	I	I	II	
	0/0	N 6	13	Cotaco	IIa	I	I	I	
	0/0	N 7	8	Cotaco	IIa	I	II	I	
	0/0	N 8	16	Frederick	IIb	I	I	II	
	0/0	N 9	6	Frederick	IIb	I	I	II	

Yield Range

Field Productivity Group	Corn Grain Bu/Acre	Barley/Intensive Wheat Bu/Acre	Std. Wheat Bu/Acre	Alfalfa Tons/Acre	Grass/Hay Tons/Acre
I	>170	>80	>64	>6	>4.0
II	150-170	70-80	56-64	4-6	3.5-4.0
III	130-150	60-70	48-56	<4	3.0-3.5
IV	100-130	50-60	40-48	NA	<3.0
V	<100	<50	<40	NA	NA

Manure Production Summary

Manure Name: Lq Dairy

Animal Summary
Dairy Cow: 80

Manure Storage Capacity: 400. kgals

Manure Analysis:
TKN: 13.35
P2O5: 6.33
NH4: 6.43
K2O: 15.51

Plant Available Nutrients:
Immediate Incorporation:
8.21 lbs N
6.33 lbs P2O5
15.51 lbs K2O
Surface Applied:
5.32 lbs N
6.33 lbs P2O5
15.51 lbs K2O
Residual N:
yr 1: .83 lbs
yr 2: .35 lbs
yr 3: .14 lbs

Manure Production

Dec-Feb	146
Mar-May	146
Jun-Aug	146
Sep-Nov	146

Total Produced: 584
Manure Sold/yr: 0
Manure purch./yr: 0

Liquid Manure Production Details

production [kgal/yr] = (# confined)[animals] * (avg wt)[animal-lbs/animal] * (prod factor)[gal/yr/animal-lb] * (0.001)[kgal/gal] + (# confined)[animals] * (waste-water)[gal/day/animal] * (365)[day/yr] * (0.001)[kgal/gal]

Group Name	animal type	%(#) confined	avg wt	prod factor	waste water	production
Dairy Cow	Dairy Cow	100(80)	1400.0	3.65	6.0	584.0

Biosolid Name: HRRSA 4-10
Availability: unlimited
Biosolid Type: Anaerobic Digestion
% solid: 2.8
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):
TKN: 106275
NH4-N: 54325
NO3: 57
P2O5: 92859.5
K2O: 13980

Plant Available Nutrients:
Immediate Incorporation:
14.64 lbs N
21.99 lbs P2O5
3.31 lbs K2O
Surface Applied:
10.14 lbs N
21.99 lbs P2O5
3.31 lbs K2O
Residual N:
yr1: 1.23 lbs N
yr2: 1.23 lbs N
yr3: 0.62 lbs N

Biosolid Name: WHITEWAVE 4-10
Availability: unlimited
Biosolid Type: Aerobic Digestion
% solid: 5.4
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):
TKN: 73750
NH4-N: 7445
NO3: 21
P2O5: 20426.8
K2O: 4200

Plant Available Nutrients:

Immediate Incorporation:

11.88 lbs N
9.25 lbs P2O5
1.9 lbs K2O

Surface Applied:

10.7 lbs N
9.25 lbs P2O5
1.9 lbs K2O

Residual N:

yr1: 3.0 lbs N
yr2: 3.0 lbs N
yr3: 1.5 lbs N

Biosolid Name: ACSA-WC 11-09
Availability: unlimited
Biosolid Type: Aerobic Digestion
% solid: 0.9
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):

TKN: 66700
NH4-N: 5400
NO3: 31108
P2O5: 43281
K2O: 6624

Plant Available Nutrients:

Immediate Incorporation:

4.06 lbs N
3.25 lbs P2O5
0.5 lbs K2O

Surface Applied:

3.92 lbs N
3.25 lbs P2O5
0.5 lbs K2O

Residual N:

yr1: 0.46 lbs N
yr2: 0.46 lbs N

yr3: 0.23 lbs N

Biosolid Name: ACSA-MR 11-09
Availability: unlimited
Biosolid Type: Aerobic Digestion
% solid: 3.0
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):
TKN: 58433
NH4-N: 5800
NO3: 2959
P2O5: 78471.43
K2O: 5904

Plant Available Nutrients:
Immediate Incorporation:
5.92 lbs N
19.63 lbs P2O5
1.48 lbs K2O
Surface Applied:
5.42 lbs N
19.63 lbs P2O5
1.48 lbs K2O
Residual N:
yr1: 1.32 lbs N
yr2: 1.32 lbs N
yr3: 0.66 lbs N

Biosolid Name: MCKEE 11-09
Availability: unlimited
Biosolid Type: Aerobic Digestion
% solid: 3.5
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):
TKN: 32700
NH4-N: 2733
NO3: 21
P2O5: 11305.73

K2O: 4075.2

Plant Available Nutrients:

Immediate Incorporation:

3.31 lbs N
3.3 lbs P2O5
1.19 lbs K2O

Surface Applied:

3.03 lbs N
3.3 lbs P2O5
1.19 lbs K2O

Residual N:

yr1: 0.87 lbs N
yr2: 0.87 lbs N
yr3: 0.44 lbs N

Biosolid Name: WHITEWAVE 11-09

Availability: unlimited
Biosolid Type: Aerobic Digestion
% solid: 5.0
pH: 6.2
%CCE: 0.0
Biosolid Analysis (ppm):

TKN: 74133
NH4-N: 6913
NO3: 20
P2O5: 20227.57
K2O: 5230.8

Plant Available Nutrients:

Immediate Incorporation:

10.87 lbs N
8.43 lbs P2O5
2.18 lbs K2O

Surface Applied:

9.86 lbs N
8.43 lbs P2O5
2.18 lbs K2O

Residual N:

yr1: 2.8 lbs N

yr2: 2.8 lbs N
yr3: 1.4 lbs N

Farm Summary Report

Plan: **New Plan** **Fall, 2007 - Summer, 2011**

Farm Name: **WALK**
Location: Augusta
Specialist: Tim Grove

Tract Name: **North River Farm Tract**
FSA Number: 0
Location: Rockingham

Field Name: **N 1**
Total Acres: 18.70 Usable Acres: 18.70
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: C Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

P-Index Summary
N-based
Phosphorus Limit method: Phosphorus Environmental Threshold (PET) method

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2008	5.5	H+(114 P ppm)	M+(107 K ppm)	A&L MIII

Soils:

PERCENT	SYMBOL	SOIL SERIES
50	29C2	Frederick Lodi
50	33C2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	12.0 tons	Rye (silage) - No Till
2008-Sp	22.5 tons	Corn (silage) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	22.5 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	150.0 bushel(s)	Corn (grain) - No Till
2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: **N 2**
Total Acres: 27.40 Usable Acres: 27.40
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

P-Index Summary
N-based
Phosphorus Limit method: VA P-Index Calulation
P-Index value = 20.35

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2007	6.5	VH(243 P ppm)	H(172 K ppm)	A&L Mill

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	29B2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME

2007-Fa	0.0	Fallow - No Till
2008-Sp	150.0 bushel(s)	Corn (grain) - No Till
2008-Fa	0.0	Fallow - No Till
2009-Sp	150.0 bushel(s)	Corn (grain) - No Till
2009-Fa	0.0	Fallow - No Till
2010-Sp	150.0 bushel(s)	Corn (grain) - No Till
2010-Fa	0.0	Fallow - No Till

Field Name: N 3
Total Acres: 8.60 Usable Acres: 8.60
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

P-Index Summary
N-based
Phosphorus Limit method: VA P-Index Calulation
P-Index value = 13.74

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2007	6.4	VH(209 P ppm)	M(104 K ppm)	A&L MIII

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	29B2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	0.0	Fallow - No Till
2008-Sp	150.0 bushel(s)	Corn (grain) - No Till

2008-Fa	0.0	Fallow - No Till
2009-Sp	150.0 bushel(s)	Corn (grain) - No Till
2009-Fa	0.0	Fallow - No Till
2010-Sp	40.0 bushel(s)	Soybeans (FS) - No Till
2010-Fa	0.0	Fallow - No Till

Field Name: **N 4**
Total Acres: 9.10 Usable Acres: 9.10
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

P-Index Summary
N-based
Phosphorus Limit method: Phosphorus Environmental Threshold (PET) method

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2008	6.3	H+(117 P ppm)	M(88 K ppm)	A&L Mlll

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	29B2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	0.0	Fallow - No Till
2008-Sp	22.5 tons	Corn (silage) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	22.5 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	40.0 bushel(s)	Soybeans (FS) - No Till

2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: N 5
Total Acres: 12.50 Usable Acres: 12.50
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

P-Index Summary
N-based
Phosphorus Limit method: Phosphorus Environmental Threshold (PET) method

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2008	5.7	H+(127 P ppm)	M-(59 K ppm)	A&L MIII

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	29B2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	0.0	Fallow - No Till
2008-Sp	40.0 bushel(s)	Soybeans (FS) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	22.5 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	22.5 tons	Corn (silage) - No Till
2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: N 6
Total Acres: 12.90 Usable Acres: 12.90

FSA Number: 0
Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 501 ft

P-Index Summary
N-based
Phosphorus Limit method: VA P-Index Calulation
P-Index value = 22.9

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2007	5.9	VH(145 P ppm)	M(89 K ppm)	A&L Mlll

Soils:

PERCENT	SYMBOL	SOIL SERIES
50	29B2	Frederick Lodi
50	18B	Cotaco

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	12.0 tons	Rye (silage) - No Till
2008-Sp	23.0 tons	Corn (silage) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	23.0 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	40.0 bushel(s)	Soybeans (FS) - No Till
2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: N 7
Total Acres: 10.70 Usable Acres: 8.30
FSA Number: 0

Tract: r Farm Tract
Location: Rockingham
Slope Class: B Hydrologic Group: C

Riparian buffer width: 0 ft
Distance to stream: 501 ft

P-Index Summary
P-based(1.5)
Phosphorus Limit method: VA P-Index Calulation
P-Index value = 32.91

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2007	6.3	VH(128 P ppm)	L+(44 K ppm)	A&L Mill
Sp-2008	6.3	VH(128 P ppm)	L+(44 K ppm)	A&L Mill

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	18B	Cotaco

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	0.0	Fallow - No Till
2008-Sp	40.0 bushel(s)	Soybeans (FS) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	23.4 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	23.4 tons	Corn (silage) - No Till
2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: N 8
Total Acres: 15.70 Usable Acres: 15.50
FSA Number: 0
Tract: r Farm Tract

Location: Rockingham
Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 501 ft

P-Index Summary
N-based
Phosphorus Limit method: VA P-Index Calulation
P-Index value = 23.47

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2007	5.9	VH(145 P ppm)	M(89 K ppm)	A&L MIII
Sp-2009	6.7	H+(109 P ppm)	M(94 K ppm)	A&L MIII

Soils:

PERCENT	SYMBOL	SOIL SERIES
100	29B2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	12.0 tons	Rye (silage) - No Till
2008-Sp	40.0 bushel(s)	Soybeans (FS) - No Till
2008-Fa	12.0 tons	Rye (silage) - No Till
2009-Sp	22.5 tons	Corn (silage) - No Till
2009-Fa	12.0 tons	Rye (silage) - No Till
2010-Sp	22.5 tons	Corn (silage) - No Till
2010-Fa	12.0 tons	Rye (silage) - No Till

Field Name: N 9
Total Acres: 6.20 Usable Acres: 6.20
FSA Number: 0
Tract: r Farm Tract
Location: Rockingham

Slope Class: B Hydrologic Group: B

Riparian buffer width: 0 ft
Distance to stream: 0 ft

Conservation Practices:
Pasture (>75% cover)

P-Index Summary
N-based
Phosphorus Limit method: Phosphorus Environmental Threshold (PET) method

Soil Test Results:

DATE	PH	P	K	Lab
Sp-2008	6.3	H(80 P ppm)	H-(143 K ppm)	A&L MIII

Soils:

PERCENT	SYMBOL	SOIL SERIES
60	29B2	Frederick Lodi
40	29C2	Frederick Lodi

Field Warnings:

Crop Rotation:

PLANTED	YIELD	CROP NAME
2007-Fa	3.4 tons	Orchard grass (hay), maint. - Tilled
2008-Sp	3.4 tons	Orchard grass (hay), maint. - Tilled
2009-Sp	3.4 tons	Orchard grass (hay), maint. - Tilled
2010-Sp	3.4 tons	Orchard grass (hay), maint. - Tilled

Report Number:
R08072-0099
Account Number:
70095

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401
Fax No. (804) 271-6446 Email: office@al-labs-eastern.com

Send To: HOUFF FEED & FERT
97 RAILSIDE DR
WEYERS CAVE, VA 24486

Grower: WALKER

Submitted By: HOUFF FEED & FERT

Farm I D: **Field I D:**

SOIL ANALYSIS REPORT

 Date Received: 3/12/2008 **Date of Analysis:** 3/13/2008 **Date of Report:** 3/14/2008

Analytical Method(s): Mehlich III

Sample Number	Lab Number	Organic Matter %	Organic Matter ENR lbs/A	Organic Matter ENR Rate	Phosphorus Available ppm	Phosphorus Available Rate	Phosphorus Reserve ppm	Phosphorus Reserve Rate	Potassium K ppm	Potassium K Rate	Magnesium MG ppm	Magnesium MG Rate	Calcium CA ppm	Calcium CA Rate	Sodium NA ppm	Sodium NA Rate	pH Soil pH	pH Buffer Index	Acidity H meq/100g	C.E.C. meq/100g
WALK1	113387	1.1	62	L L	114	V VH			107	H H	110	M M	760	M M			5.5	6.8	1.7	6.7
WALK4	113388	2.3	87	L L	117	V VH			88	M M	74	M M	907	H H			6.3	6.9	0.6	6.0
WALK5	113389	2.2	85	L L	127	V VH			59	L L	85	M M	767	M M			5.7	6.8	1.3	5.9
WALK7	113390	1.5	73	L L	128	V VH			44	V VL	78	M M	719	H H			6.3	6.9	0.5	4.9
WALK6;8;	113391	2.2	84	L L	145	V VH			89	M M	93	M M	951	M M			5.9	6.8	1.2	7.0

Sample Number	Percent Base Saturation K %	Mg %	Ca %	Na %	H %	Nitrate NO3-N ppm	Nitrate Rate	Sulfur SO4-S ppm	Sulfur Rate	Zinc ZN ppm	Zinc Rate	Manganese MN ppm	Manganese Rate	Iron FE ppm	Iron Rate	Copper CU ppm	Copper Rate	Boron B ppm	Boron Rate	Soluble Salts ms/cm	Soluble Salts Rate	Chloride CL ppm	Chloride Rate	Aluminum AL ppm	Aluminum Rate
WALK1	4.1	13.6	56.5		25.8																				
WALK4	3.8	10.3	75.4		10.6																				
WALK5	2.5	11.9	64.5		21.1																				
WALK7	2.3	13.3	73.8		10.6																				
WALK6;8;	3.3	11.2	68.4		17.2																				

ALE-Soil

Values on this report represent the plant available nutrients in the soil.
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams).
Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to the sample(s) tested. Samples are retained a maximum of thirty days after testing. Soil Analysis prepared by: A & L EASTERN LABORATORIES, INC.

by: Paul Chu, Ph.D.

Report Number:
R08072-0099
Account Number:
70095

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401
Fax No. (804) 271-6446 Email: office@al-labs-eastern.com

Send To: HOUFF FEED & FERT
97 RAILSIDE DR
WEYERS CAVE, VA 24486

Grower: WALKER

Submitted By: HOUFF FEED & FERT

Farm I D: **Field I D:**

SOIL ANALYSIS REPORT

Page: 2 **Date Received:** 3/12/2008 **Date of Analysis:** 3/13/2008 **Date of Report:** 3/14/2008

Analytical Method(s):
Mehlich III

Sample Number	Lab Number	Organic Matter %	Organic Matter ENR lbs/A	Organic Matter ENR Rate	Phosphorus Available ppm	Phosphorus Available Rate	Phosphorus Reserve ppm	Phosphorus Reserve Rate	Potassium K ppm	Potassium K Rate	Magnesium MG ppm	Magnesium MG Rate	Calcium CA ppm	Calcium CA Rate	Sodium NA ppm	Sodium NA Rate	pH Soil pH	pH Buffer Index	Acidity H meq/100g	C.E.C. meq/100g
WALK-9	11392	2.9	96	M	80	H			143	H	189	H	1082	M			6.3	6.8	0.9	8.2

Sample Number	Percent Base Saturation K %	Mg %	Ca %	Na %	H %	Nitrate NO3-N ppm	Nitrate Rate	Sulfur SO4-S ppm	Sulfur Rate	Zinc ZN ppm	Zinc Rate	Manganese MN ppm	Manganese Rate	Iron FE ppm	Iron Rate	Copper CU ppm	Copper Rate	Boron B ppm	Boron Rate	Soluble Salts ms/cm	Soluble Salts Rate	Chloride CL ppm	Chloride Rate	Aluminum AL ppm	Aluminum Rate
WALK-9	4.5	19.2	65.8		10.6																				

ALE-Soil

Values on this report represent the plant available nutrients in the soil.
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams).
Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to the sample(s) tested. Samples are retained a maximum of thirty days after testing. Soil Analysis prepared by:
A & L EASTERN LABORATORIES, INC.

by: Paul Chu, Ph.D.

Report Number:
R09050-0040
Account Number:
70095

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401
Fax No. (804) 271-6446 Email: office@al-labs-eastern.com

Send To: HOUFF FEED & FERT
97 RAILSIDE DR
WEYERS CAVE, VA 24486

Grower: WALKER

Submitted By: HOUFF FEED & FERT

Farm I D: **Field I D:**

SOIL ANALYSIS REPORT

Page: 1 **Date Received:** 2/19/2009 **Date of Analysis:** 2/20/2009 **Date of Report:** 2/23/2009

Analytical Method(s):
Mehlich III

Sample Number	Lab Number	Organic Matter %	Organic Matter ENR lbs/A	Organic Matter ENR Rate	Phosphorus Available ppm	Phosphorus Available Rate	Phosphorus Reserve ppm	Phosphorus Reserve Rate	Potassium K ppm	Potassium K Rate	Magnesium MG ppm	Magnesium MG Rate	Calcium CA ppm	Calcium CA Rate	Sodium NA ppm	Sodium NA Rate	pH Soil pH	pH Buffer Index	Acidity H meq/100g	C.E.C. meq/100g
WALK2	15291	2.5	84	L	204	VH			142	H	156	M	1718	H			6.6	6.9	0.6	10.9
WALK6	15292	1.9	79	L	153	VH			82	M	110	M	933	H			6.3	6.9	0.7	6.5
WALK8	15293	2.2	82	L	109	VH			94	M	108	M	1404	H			6.7	6.9	0.4	8.5

Sample Number	Percent Base Saturation K %	Mg %	Ca %	Na %	H %	Nitrate NO3-N ppm	Nitrate Rate	Sulfur SO4-S ppm	Sulfur Rate	Zinc ZN ppm	Zinc Rate	Manganese MN ppm	Manganese Rate	Iron FE ppm	Iron Rate	Copper CU ppm	Copper Rate	Boron B ppm	Boron Rate	Soluble Salts ms/cm	Soluble Salts Rate	Chloride CL ppm	Chloride Rate	Aluminum AL ppm	Aluminum Rate
WALK2	3.3	11.9	78.8		5.9																				
WALK6	3.2	14.2	72.0		10.6																				
WALK8	2.8	10.5	82.2		4.5																				

ALE-Soil

Values on this report represent the plant available nutrients in the soil.
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams).
Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to the sample(s) tested. Samples are retained a maximum of thirty days after testing. Soil Analysis prepared by:
A & L EASTERN LABORATORIES, INC.

by: Paul Chu, Ph.D.